

Serial No.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claim 3 has been amended as follows:

3. (Amended) A polynucleotide according to claim 1 ~~or claim 2~~, selected from the group consisting of:
- (a) the polynucleotide sequences shown in FIGS 10 to 15;
 - (b) the polynucleotide sequences which hybridize under stringent conditions to the complementary sequences of (a); and
 - (c) polynucleotide sequences which are degenerate to polynucleotide sequences of (a) or (b).

Claim 4 has been amended as follows:

4. (Amended) A polynucleotide according to ~~any one of the preceding claims~~ claim 1, lacking the native leader sequences or any of the 5' or 3' untranslated regions of the polynucleotide.

Claim 6 has been amended as follows:

6. (Amended) A polynucleotide according to ~~any one of the preceding claims~~ claim 1, which encodes codeinone reductase enzyme of *Papaver somniferum*.

Claim 7 has been amended as follows:

7. (Amended) A polynucleotide according to ~~any one of the preceding claims~~ claim 1, which is a synthetic polynucleotide comprising one or more codons preferred for expression in plant cells.

Claim 10 has been amended as follows:

10. (Amended) An isolated and purified polynucleotide having a sequence which is complementary to all or part of the sequence of a polynucleotide according to ~~any one of the claims of claims 1 to 10~~ claim 1.

Claim 11 has been amended as follows:

11. (Amended) A recombinant DNA construct comprising the polynucleotide according to ~~any one of claims 1 to 10~~ claim 1.

Serial No.

Claim 13 has been amended as follows:

13. (Amended) A DNA construct according to claim 11 ~~or claim 12~~, capable of directing prokaryotic or eukaryotic expression of the polynucleotide encoding a codeinone reductase enzyme.

Claim 14 has been amended as follows:

14. (Amended) A DNA construct according to ~~any one of claims 11 to 13~~ claim 11, comprising a promoter suitable to control the expression of the polynucleotide.

Claim 20 has been amended as follows:

20. (Amended) An isolated and purified codeinone reductase enzyme, being a product of prokaryotic or eukaryotic expression of the polynucleotide of ~~any one of claims 1 to 10 or a DNA construct of any one of claims 11 to 19~~ claim 1.

Claim 28 has been amended as follows:

28. (Amended) An enzyme according to ~~any one of claims 20 to 27~~ claim 20, which is a variant incorporating amino acid deletions, substitutions, additions or combinations thereof, wherein the variant retains one or more of the biological properties of codeinone reductase enzyme.

Claim 29 has been amended as follows:

29. (Amended) A cell transformed or transfected with a polynucleotide according to ~~any one of claims 1 to 10 or a DNA construct according to any one of claims 11 to 19~~ claim 1.

Claim 36 has been amended as follows:

36. (Amended) A callus transformed or transfected with a polynucleotide according to ~~any one of claims 1 to 10 or DNA construct according to any one of claims 11 to 19~~ claim 1.

Claim 37 has been amended as follows:

37. (Amended) A plant transformed or transfected with a polynucleotide according to ~~any one of claims 1 to 10 or DNA construct according to any one of claims 11 to 19~~ claim 1, wherein the plant exhibits altered expression of the codeinone reductase enzyme.

Claim 40 has been amended as follows:

40. (Amended) A plant according to ~~any one of claims 37 to 39~~ claim 37, which is an alkaloid poppy plant.

Serial No.

Claim 42 has been amended as follows:

42. (Amended) A plant according to claim 40 ~~or claim 41~~, wherein the alkaloid poppy plant is *Papaver somniferum*.

Claim 43 has been amended as follows:

43. (Amended) A method for preparing plants which overexpress a codeinone reductase enzyme, comprising transfecting or transforming a plant cell, a plant part or a plant, with the polynucleotide according to ~~any one of claims 1 to 10 or DNA construct according to any one of claims 11 to 19~~ claim 1.

Claim 49 has been amended as follows:

49. (Amended) A stand of stably reproducing alkaloid poppies transformed or transfected with a polynucleotide according to ~~any one of claims 1 to 10 or DNA construct according to any one of claims 11 to 19~~ claim 1 having altered expression of the codeinone reductase enzyme.

Claim 50 has been amended as follows:

50. (Amended) A stand of stably reproducing alkaloid poppies transformed or transfected with a polynucleotide according to ~~any one of claims 1 to 10 or DNA construct according to any one of claims 11 to 19~~ claim 1 having a higher or different alkaloid content when compared to a plant which has not been so transformed or transfected.

Claim 51 has been amended as follows:

51. (Amended) A stand of stably reproducing alkaloid poppies according to claim 49 ~~or claim 50~~, wherein the alkaloid poppy is *Papaver somniferum*.

Claim 52 has been amended as follows:

52. (Amended) Straw of stably reproducing poppies according to ~~any one of claims 49 to 51~~, claim 49 having a higher or different alkaloid content when compared to the straw obtained from an alkaloid poppy which has not been transformed or transfected.

Claim 54 has been amended as follows:

54. (Amended) An alkaloid when isolated from the straw according to ~~any one of claims 49 to 52 or the concentrate according to claim 53~~ claim 49.

Serial No.

Claim 56 has been amended as follows:

56. (Amended) A method for the production of poppy plant alkaloids, comprising the steps of;
- a) harvesting capsules of an alkaloid poppy plant transformed or transfected with a polynucleotide according to ~~any one of claims 1 to 10 or DNA construct according to any one of claims 11 to 19~~ claim 1, to produce a straw where the poppy plant is such a plant that the straw has a higher or different alkaloid content when compared to the straw obtained from a poppy plant which has not been transformed or transfected, and
 - b) chemically extracting the alkaloids from the straw.

Claim 57 has been amended as follows:

57. (Amended) A method for the production of poppy alkaloids, comprising the steps of ;
- a) collecting and drying the latex of the immature capsules of an alkaloid poppy plant transformed or transfected with a polynucleotide according to ~~any one of claims 1 to 10 or DNA construct according to any one of claims 11 to 19~~ claim 1, to produce opium wherein the poppy plant is such a plant that the opium has a higher or different alkaloid content when compared to the opium obtained from a poppy plant which has not been transformed or transfected, and
 - b) chemically extracting the alkaloids from the opium.

Claim 58 has been amended as follows:

58. (Amended) A method according to claim 56 ~~or claim 57~~, wherein the alkaloid is selected from the group consisting of morphine, codeine, oripavine and thebaine.